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**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Docket Number (Optional)

04329.2306

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on \_\_\_\_\_

Signature \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Application Number

09/559,757

Filed

04/27/2000

First Named Inventor

Yoshio OZAWA

Art Unit

2823

Examiner

Pham, Thanh V.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.  
(Form PTO/SB/96)

☐ attorney or agent of record.  
Registration number \_\_\_\_\_

☒ attorney or agent acting under 37 CFR 1.34.  
Registration number if acting under 37 CFR 1.34 53,235



Signature

David M. Longo

Typed or printed name

202-408-4489

Telephone number

10/25/2005

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.  
Submit multiple forms if more than one signature is required, see below\*.

☒ \*Total of 1 forms are submitted.

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PATENT  
Customer No. 22,852  
Attorney Docket No. 04329.2306

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Yoshio Ozawa et al.	)	Group Art Unit: 2823
	)	
Application No.: 09/559,757	)	Examiner: Pham, Thanh V.
	)	
Filed: April 27, 2000	)	Confirmation No. 2923
	)	
For: METHOD OF MANUFACTURING	)	
A SEMICONDUCTOR DEVICE	)	
USING AN OXIDATION PROCESS	)	

**MAIL STOP AF**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Applicants request a pre-appeal brief review of the rejections in the Final Office Action mailed on June 28, 2005. This Request is being filed concurrently with a Notice of Appeal, in accordance with the Official Gazette Notice of July 12, 2005.

**Remarks** begin on page 2 of this paper.

### **REMARKS**

Claims 8-21 remain pending, with claims 16-19 withdrawn from consideration as drawn to a nonelected invention, and claims 8-15, 20, and 21 under current examination and the subject of this Pre-Appeal Brief Request for Review. In the Office Action mailed on June 28, 2005, Applicants' claims having been at least twice-rejected, the Examiner rejected claims 8-15, 20, and 21 under 35 U.S.C. § 103(a) as unpatentable over Applicants' admitted prior art ("AAPA") in combination with Hisamune (U.S. Patent No. 6,414,352 B1) ("Hisamune"), Aminzadeh, et al. (U.S. Patent No. 6,707,120 B1) ("Aminzadeh"), and Wolf, et al. ("Silicon Processing for the VLSI Era," v.1, 1986, pp. 161-238) ("Wolf").

#### **Rejection of Claims 8-15, 20, and 21 under 35 U.S.C. § 103(a):**

The Examiner's rejection contains clear errors and omits the essential elements necessary for a *prima facie* case of obviousness of Applicants' independent claims 8 and 12. AAPA in combination with Hisamune, Aminzadeh, and Wolf do not teach or suggest each and every element of independent claims 8 and 12, in particular:

the thermal oxidation process using an oxidizing gas containing one of ozone and oxygen radicals, the oxygen radicals being generated by remote plasma oxidizing method or by reacting a first gas containing oxygen and a second gas containing hydrogen, and a concentration of nitrogen of the part of the insulating film under an edge portion of the film being decreased by the thermal oxidation process (claim 8);

the thermal oxidation process using an oxidizing gas containing one of ozone and oxygen radicals, the oxygen radicals being generated by remote plasma oxidizing method or by reacting a first gas containing oxygen and a second gas containing hydrogen, and a concentration of nitrogen of the part of the insulating film under an edge portion of the film being decreased by the thermal oxidation process; and subjecting the semiconductor structure subjected to the oxidation process to at least one of a nitridation process and an additional oxidation process (claim 12).

In response to Applicants' amendment of independent claims 8 and 12 in the Amendment of May 11, 2005 (adding the element "a concentration of nitrogen of the part of the insulating film under an edge portion of the film being decreased by the thermal oxidation process"), the Examiner cited Wolf to teach that "the incorporation of oxidant into the Si/SiO<sub>2</sub>, in this case, the insulating film containing silicon and nitrogen, would reduce the concentration of nitrogen of the part of the insulating film under an edge portion of the film by the thermal oxidation process" (Office Action, p. 4, bottom). This still does not address the fact that none of the cited references teach or suggest the above-quoted claimed combination of process steps *taken as a whole*.

In the "Response to Arguments" section of the Office Action, the Examiner first alleged that "the formed structure of applicant's admitted prior art will endure the thermal oxidation of Hisamune to have the semiconductor substrate's surface lowered and the concentration of nitrogen decreased (these symptoms are supported by Wolf)" (Office Action, p. 7). Whether or not the formed structure of AAPA "will endure" Hisamune's thermal oxidation process does not demonstrate that the cited references teach or suggest the above-quoted claimed combination of process steps *taken as a whole*.

Second, the Examiner alleged that Wolf teaches the claimed thermal oxidation process by virtue of the title of Wolf's chapter 7 being "Thermal Oxidation." "With that point of view, thermal oxidation and CVD process[es] are ways of forming SiO<sub>2</sub>" (Office Action, p. 7). Again, Applicants note that while Wolf may teach thermal oxidation in Chapter 7, the portions addressed by the Examiner (page 202, cited on page 3 of the Office Action) do not lend themselves to combination with either Hisamune or AAPA at least because Wolf's discussion of an oxidation model shown Fig. 3 on p. 202 invokes Henry's law, which "implies that the oxidizing species moves through the oxide *in molecular form, since the law does not hold under*

*conditions of molecular dissociation*” (Wolf, p. 203, emphasis added). This contradicts at least Applicants’ claimed “using an oxidizing gas containing one of *ozone and oxygen radicals*, the oxygen radicals being generated by *remote plasma oxidizing method*” (emphasis added). In addition, Wolf’s teaching that “[t]he plasma-enhanced oxide growth process, however, suffers from several disadvantages...” (p. 219), which clearly does not provide any motivation to one of ordinary skill in the art to select Wolf in combination with Hisamune to cure the deficiencies of AAPA in relation to the above-quoted elements of independent claims 8 and 12.

Third, the Examiner alleged that “the re-oxidized nitrided oxide applied on the gate structure of applicant’s admitted prior art could increase the thickness of side oxide 201 as pointed out by Aminzadeh et al. ... The same performance as of the instant invention that increases the thickness of side oxide would also make the surface of the obtained semiconductor substrate lower” (Office Action, p. 9). The Examiner’s application of Aminzadeh (and its internal reference to “Kusunoki et al. in IEEE IEDM, vol. 91”), particularly Figs. 2 and 6 (Office Action, p. 4), do not cure the deficiencies of Wolf in combination with Hisamune and AAPA in relation to the above-quoted elements of independent claims 8 and 12.

In addition, Applicants refer to the previous arguments of record in the Amendment filed on May 11, 2005, particularly on page 8 (last full paragraph) to page 13 (last paragraph). In summary, Applicants’ reasoning has exposed the errors of the Examiner’s arguments which attempt to rationalize a combination of the cited references - as the written record demonstrates. A full consideration of each of the cited references clearly exposes their deficiencies and the lack of motivation to combine them.

For the reasons presented above, the 35 U.S.C. § 103(a) rejection is clearly legally and factually deficient, for failing to demonstrate that the applied references, taken alone or in

combination, teach or suggest at least the above-quoted elements of independent claims 8 and 12, and for failing to provide the required motivation to combine the cited references. Independent claims 8 and 12 are therefore allowable, and dependent claims 9-11, 13-15, 20, and 21 are also allowable at least by virtue of their respective dependence from allowable base claim 8 or 12. Therefore, the improper 35 U.S.C. § 103(a) rejection should be withdrawn.

**Conclusion:**

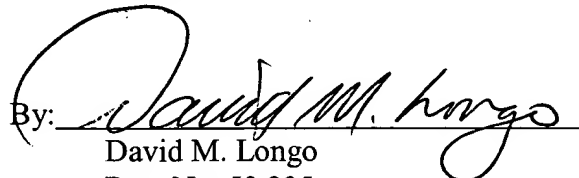
In view of the foregoing, Applicants request a pre-appeal brief review of the rejections in the Final Office Action mailed on June 28, 2005. Pending claims 8-15, 20, and 21 are in condition for allowance, and Applicants request a favorable action.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: October 25, 2005

By:   
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